1939

A New Giant Camel *GIGANTOCAMELUS FRICKI*, gen. et sp. nov.

Erwin Hinckley Barbour

C. Bertrand Schultz

BULLETIN OF THE UNIVERSITY OF NEBRASKA
STATE MUSEUM
Erwin Hinckley Barbour, Director

VOLUME 2 LINCOLN, NEBRASKA, SEPTEMBER 1939 NUMBER 2

A New Giant Camel

GIGANTOCAMELUS FRICKI, gen. et sp. nov.

By Erwin Hinckley Barbour and C. Bertrand Schultz

DEVELOPMENT OF THE BROADWATER-LISCO QUARRIES

A lower Pleistocene deposit containing fossil vertebrates near Broadwater, Morrill county, Nebraska, has been reported upon by the writers, beginning three years ago.[1] Five fossil quarries have been opened since the site was discovered in 1936. A quantity of fine specimens from this area is now in the collections of the University of Nebraska State Museum. During June 1936, members of the Nebraska field party,[2] while exploring east of the Broadwater quarries, discovered several localities that yielded *Stegomastodon* and camel bones. In one of these (S½ of sec. 11, T. 18 N., R. 46 W., Garden county) the distal end of an unusually large camel metapodial (No. 9-19-6-36 S.P.) and associated skeletal elements were found. The site was revisited in September 1937, and at that time numerous bones including a skull (No. 1-20-9-37 S.P.) were unearthed. Mr. Charles Sothman of Lisco, who had charge of the land where the camel bones were found, reported to the collectors that he had noticed similar fossil remains farther east. During the falls of 1937 and 1938 Messrs. Sweet, Middleswart and Chaloupka of Bridgeport did a considerable amount of exploratory work which was extended through the winters. Numerous prospects were located and test pits were dug. Three quarries were opened in the SE¼ of sec. 13, T. 18 N., R. 46 W., 3 miles east and 2½ miles north of Lisco, Garden county. During 1938, from June 10 to October 1, the Lisco quarries were worked by a field party from the

[1] See Bibliography, p. 26. Barbour & Schultz (1936, p. 308; 1937A, p. 1-10; 1937B, p. 185-9).

[2] Field work at Broadwater was carried on under direction of the junior writer. The collecting party included Messrs. E. L. Blue, Thompson M. Stout, Frank Crabill, Gordon Graham, Jack Graham, David Abbott, Dean Kerl, Fred Schall, Mrs. C. Bertrand Schultz, and was aided by Messrs, S. R. Sweet, T. C. Middleswart, W. F. Chaloupka, and John Ochoa.

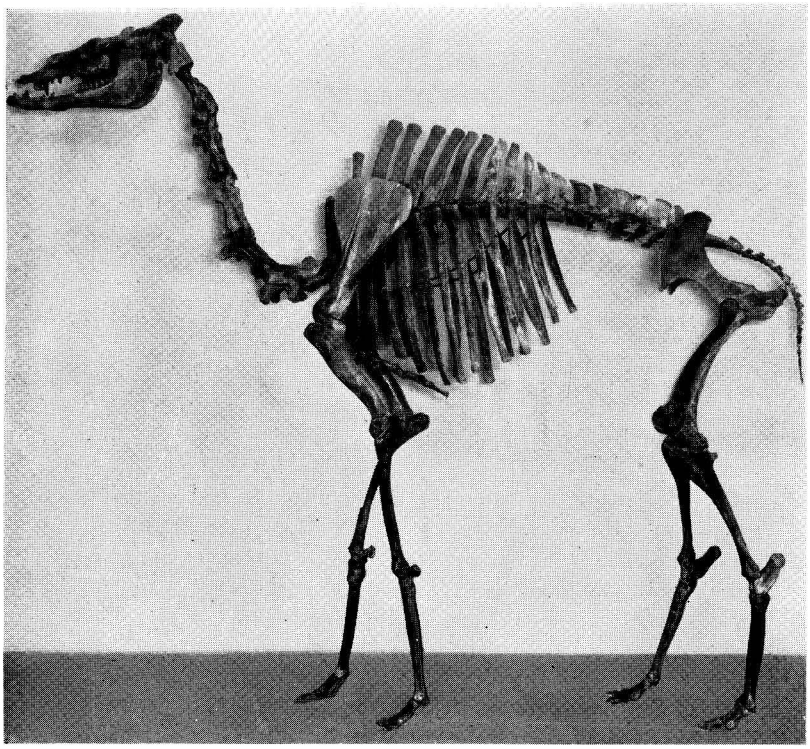

Fig. 5.—*Gigantocamelus fricki,* new genus and species. Composite skeleton. No. 1-25-8-38 S.P., The University of Nebraska State Museum. ×1/30. The skeleton has been skillfully mounted without visible supports by Mr. Henry Reider and Mr. Frank Bell.

University of Nebraska State Museum, assisted by a Works Progress Administration project under the supervision of Jack Graham and Paul Burkholder. Forty crates of rare camel material were shipped to the Museum from these quarries. A detailed report based on these specimens will appear in a forthcoming paper.

In October 1938, several camel prospects were located east of the original quarries in S½ of sec. 21, T. 18 N., R. 45, Garden county, on the land of Bertha Vocke and Conrad Wallace. The largest examples of *Gigantocamelus* have come from these new pits. The Lisco area is being worked extensively during the 1939 field season by a Museum party.

The writers are grateful to Mr. Childs Frick for his special interest in the Lisco quarries and for permitting the study of his excellent collection of *Megacamelus* from Arizona. Thanks are also due to Messrs. S. R. Sweet,

Fig. 6.—Crown view of skull of *Gigantocamelus fricki*. No. 1A-25-8-38 S.P., The University of Nebraska State Museum. × 9/40.

T. C. Middleswart, and W. F Chaloupka for their assistance in helping to develop the various camel quarries. Mr. Frank Ruby of Lisco aided the Museum parties by granting permission to excavate at the type locality. The Works Progress Administration staff in Nebraska, especially Mrs. Ethel May Sanmann, Mr. E. O. Raasch, and Miss Lilla Graham, liberally cooperated with the Museum in securing sufficient help in the field and laboratory to excavate and prepare the fossil camel bones.

DESCRIPTION AND DISCUSSION

Gigantocamelus fricki, NEW GENUS AND SPECIES

Type.—Skull, No. 1A-25-8-38 S.P., University of Nebraska State Museum.

Referred.—Mandible, No. 1B-25-8-38, S.P. (from different individual than skull), and composite skeleton, No. 1-25-8-38 S.P. (mounted with type skull; limb elements, except for metapodials, appear to be from one individual) and a large collection of skulls, rami and skeletal parts from the Lisco quarries.

Locality.—Lisco quarries 1, 2 and 3, SE¼ of sec. 13, T. 18 N., R. 46 W., Garden county, Nebraska.

Horizon.—Lower Pleistocene.

Generic and Specific Characters.—Largest of known camelids; form and proportions approaching those of *Megacamelus* and *Titanotylopus,* but differing in dental formula and other characters; dental formula, $I^{0-1}/_{3}$, $C^{1}/_{1}$, $P^{3}/_{3}$, $M^{3}/_{3}$, with premolar 2, above and below, absent; I^{3} rarely present; inferior and superior canines enlarged into tusks; posterior portion of canine very thin and with a sharp edge; mandible long and narrow, not so massive as that of *Titanotylopus*; skeletal parts more massive and much larger than those of *Camelops*; average metapodials and other limb elements more massive than those of *Megacamelus.*

Associated Genera.—*Smilodon, Megalonyx, Stegomastodon* and *Equus.* The fauna of the Broadwater quarries in Morrill county is listed at the end of this report.

Measurements.—See table of measurements on opposite page.

Discussion.—The Lisco specimens appear to differ from any known camel remains. It is difficult to assign them to an already established genus and the writers consider the differences to be of generic value. With a large series of superior and inferior dentitions available, it is noted that the dental formula is very stable. The enlargement of the canines, as noted in *Gigantocamelus,* is unusual among the camels. A few examples from Lisco have smaller canines than the average, but these may represent females. Enlarged canines are also found in *Titanotylopus* (Barbour & Schultz 1934, p. 291-4), a large camel that lived later in the Pleistocene. This latter genus is known only from a partial mandible but it seems to be quite distinct from *Gigantocamelus* in the definite absence of P_1 and the greatly reduced distance between the canine and P_3. *Titanotylopus* may be more closely related to *Camelops.*

Childs Frick (1929, p. 107) has described a huge extinct camel, *Megacamelus,* from the Hopi Indian Agency of Arizona. This form has a

MEASUREMENTS

SKULL MEASUREMENTS

	1A-25-8-38 S.P.	1-20-10-38 S.P.
	mm.	*mm.*
Length (max., including supraoccipital crest and premaxillae)	757	855E[3]
Condylo-basal length (condyles to anterior of premaxillae)	720	840 A
Width (max., at orbits)	345	368 A
Width (min., interorbital)	284	
Length of dental series (C–M 3 inclusive)	390	424
Length, P 3–M 3 inclusive	206	197
Length, P 3–P 4	67	65
Length of superior molar series	141	135
Diastema, C to P 1	56	44 A
Diastema, P 1 to P 3	92	143 A
Diameter (max.) of canine at base	55	45
Length of canine	77	81
Length of P 1	29	36

JAW MEASUREMENTS

	1B-25-8-38 S.P.	9-20-9-37 S.P.	2-25-8-38 S.P.
Length (max., including incisors)	660 A	635 E	
Length from posterior of condyle to anterior of canine	633	603 A	
Depth of ramus below anterior of third inferior molar	88	94	90
Length of dental series (C–M3 inclusive)	452	443	
Length of inferior molar–premolar series (including P 1)	340	372	327
Length, P 3–M 3	210	254	211
Length, P 3–P 4	55	60	51
Length, M 1–M 3	159	201	162
Diastema, C–P 1	79	52	
Diastema, P 1–P 3	106	104	100

MEASUREMENTS OF SKELETAL ELEMENTS

	1-25-8-38 S.P.
Length of:	
Scapula (max.)	560 E
Humerus (articular)	497
Radius (articular)	551
Radius-ulna (max.)	653
Metacarpal (max.)	425
Femur (articular)	563
Tibia (articular)	477
Calcaneum (max.)	176
Metatarsal (max.)	404

[3]E=estimated; A=approximate.

Fig. 7.—Palatine view of skull of *Gigantocamelus fricki*. No. 1A-25-8-38 S.P., The University of Nebraska State Museum. × 9/40.

Fig. 8.—Side view of skull of *Gigantocamelus fricki*. No. 1A-25-8-38 S.P., The University of Nebraska State Museum. × 9/40.

Fig. 9.—Crown view of mandible of *Gigantocamelus fricki*. No. 9-20-9-37 S.P., The University of Nebraska State Museum. × 9/40. Note deciduous canines still present.

marked facial fossa, I^3 is present and the canines are not enlarged. These characters are not observed in *Gigantocamelus*. The skeletal elements appear to be more massive in the Nebraska form. The parts used in the mount are from small individuals. Unfortunately, there were not enough of the largest bones for a mount. One of these giants would stand nearly 12 feet tall.

Megatylopus (Matthew & Cook 1909, p. 396-401), an Upper Tertiary camel from Nebraska, cannot readily be compared with *Gigantocamelus*. *Megatylopus* is a smaller genus with a dentition, $I^1/_3$, $C^1/_1$, $P^{3-2}/_{3-2}$, $M^3/_3$. The reduction in the premolar series here suggests that these two genera represent independent lines of development. *Pliauchenia spatula* Cope, a species often referred to the genus *Megatylopus,* seems to be much more closely allied to *Gigantocamelus fricki* than to *M. gigas,* the genotypic species of *Megatylopus.*

LIST OF MAMMALS FROM BROADWATER QUARRIES [4]

INSECTIVORA
Sorex sp. Shrew.

EDENTATA
Mylodon sp. Ground sloth.

LAGOMORPHA
Lepus? sp. Jack rabbit.
Sylvilagus? sp. Cottontail.

RODENTIA
Sciurid. Squirrel.
Geomys sp. Pocket gopher.
Thomomys? sp. Pocket gopher.
Procastoroides sweeti Barbour and Schultz. Ancestral giant beaver.
Dipoides? sp. Ancestral beaver.
Peromyscus sp. Deer mouse.
Ondatra sp. Muskrat.
Mimomys? sp. Vole.
Microtinid indet. Vole.
Zapus sp. Jumping mouse.
Neotoma? sp. Wood rat.

CARNIVORA
Canis sp., near *C. latrans* Say. Coyote.
Canis sp., near *Canis (Aenocyon) dirus* Leidy. Dire wolf.
Satherium piscinaria middleswarti Barbour and Schlutz. Otter.
Felid. Cat.

PROBOSCIDEA
Stegomastodon mirificus primitivus Osborn. Mastodont.

PERISSODACTYLA
Equus sp., near *E. excelsus* Leidy. Horse.
Equus sp., more primitive species. Horse.
Equid, very light-limbed form; known only from a single metapodial. Horse.

[4] The Broadwater quarries are located 4 miles east and 1 mile north of Broadwater, in NE¼ of sec. 20 and NW¼ of sec. 21, T. 19 N., R. 47 W., Morrill county, Nebraska, on the farm of Mr. Dan J. Boman.

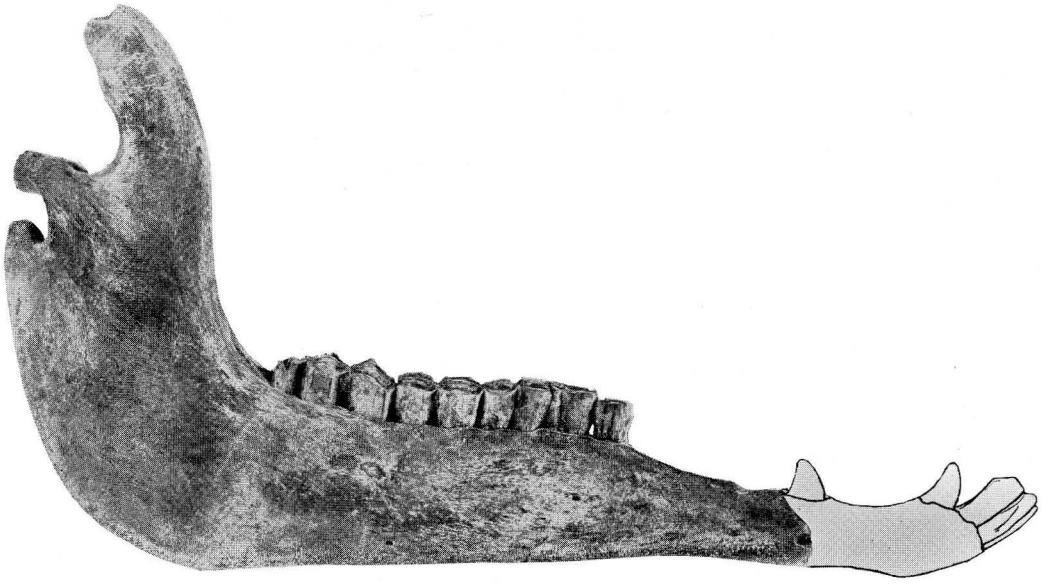

Fig. 10.—Side view of right ramus of *Gigantocamelus fricki*. No. 2-25-8-38 S.P., The University of Nebraska State Museum. × 9/40.

ARTIODACTYLA

Camelops sp., much larger form than *C. kansanus* Leidy. Camel.
Tanupolama sp., much larger form than *T. americanus* (Wortman). Llama-like camel.
Gigantocamelus fricki Barbour and Schultz. Giant camel.
Capromeryx sp., larger form than *C. furcifer* Matthew. Small antelope.
Antilocaprid, probably *Tetrameryx*. Four-horned antelope.

The collection from the Broadwater quarries also contains the following unidentified vertebrates:

PISCES

Various forms.

AMPHIBIA

A large collection of amphibian material, especially frogs. Three or four families are represented. This material is now being studied by Dr. Edward H. Taylor of the Department of Zoology, University of Kansas.

REPTILIA

Turtle, perhaps two forms.
Snake, at least one form.

AVES

Various forms.

BIBLIOGRAPHY

Barbour, Erwin H. and C. Bertrand Schultz. 1934. A new giant camel, *Titanotylopus nebraskensis,* gen. et sp. nov. Bul. Neb. State Mus. **1**(36):291-4. May.

————1936. Notice of a new bone bed in the early Pleistocene of Morrill county, Nebraska. Bul. Neb. State Mus. **1**(45):383. April.

————1937A. An early Pleistocene fauna from Nebraska. Am. Mus. Nov. (942):1-10. Sept. 10.

————1937B. Pleistocene and post-glacial mammals of Nebraska. In "Early Man," p. 185-9. Lippincott.

Cope, E. D. 1875. On some new fossil Ungulata. Proc. Acad. Nat. Sci. Phila., p. 258.

————1884. The extinct Mammalia of the Valley of Mexico. Proc. Am. Philos. Soc. **22**:16-18.

————1893. A preliminary report on the vertebrate paleontology of the Llano Estacado. 4th Ann. Rep. Geol. Surv. Texas. p. 70-3.

Frick, Childs. 1929. History of the earth (Childs Frick Tertiary-Quaternary explorations, 1928). Nat. Hist. **24**(1):106-8. Jan.-Feb.

Gregory, Joseph T. 1937. Association of skull and limb bones in a new species of camel, with a review of the genus *Pliauchenia* (Abstract). Proc. Geol. Soc. Am. for 1936, p. 388.

Hay, Oliver P. 1913. Camels of the fossil genus *Camelops.* Proc. U. S. Nat. Mus. **46**(2025):267-77. Dec. 6.

Leidy, Joseph. 1854. Description of a fossil apparently indicating an extinct species of the camel tribe. Proc. Acad. Nat. Sci. Phila. **7**:172-3.

Matthew, W. D. 1918. Contributions to the Snake Creek fauna. Bul. Am. Mus. Nat. Hist. **38**(7):216-17. April 18.

Matthew, W. D. and Harold J. Cook. 1909. A pliocene fauna from Nebraska. Bul. Am. Mus. Nat. Hist. **26**(27):395-407. Sept. 3.

Schultz, C. Bertrand. 1934. The Pleistocene mammals of Nebraska. Bul. Neb. State Mus. **1**(41):388.

Wortman, J. L. 1898. The extinct Camelidae of North America and some associated forms. Bul. Am. Mus. **10**(7):93-142. April 9.

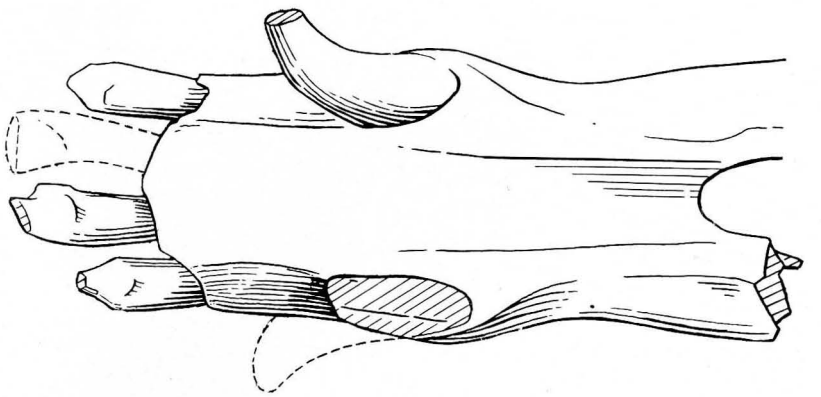

Fig. 11.—Crown view of the anterior portion of mandible of *Titanotylopus nebraskensis* Barbour & Schultz. No. 1-6-9-33 S.P., The University of Nebraska State Museum. × 2/5. Drawing by Lynn Robert Wolfe.

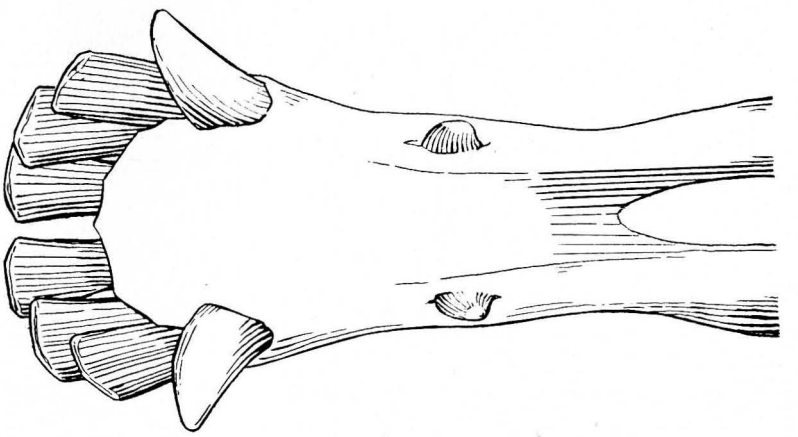

Fig. 12.—Crown view of the anterior portion of mandible of *Gigantocamelus fricki*. No. 9-20-9-37 S.P., The University of Nebraska State Museum. × 2/5. Drawing by Lynn Robert Wolfe.